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882835 (08) 5930179 July 27, 1999

#### UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

5930179

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July 27, 1999

# Program .circuit

**REISSUE:** July 25, 2001 - Reissue Application filed Ex. Gp.: 2818; Re. S.N. 09/915,906 (O.G. June 25, 2002)

INVENTOR: Cha, Byoung Kwon - Ichon-Shi, Korea, South (KR)

**APPL-NO:** 882835 (08)

FILED-DATE: June 26, 1997

**GRANTED-DATE:** July 27, 1999

**PRIORITY:** June 29, 1996 - 9625547, Korea, South (KR)

**ASSIGNEE-PRE-ISSUE:** June 26, 1997 - ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS)., HYUNDAI ELECTRONCIS INDUSTRIES CO., LTD. SAN 136-1, AMI-RI, BUBAL-UEP, ICHON-SHIKYUNGKI-DO, (1), Reel and Frame Number: 008662/0411

**ASSIGNEE-AT-ISSUE:** Hyundai Electronics Industries, Co., Ltd., Kyungki, Korea, South (KR), Foreign company or corporation (03)

**LEGAL-REP:** Harris, Scott C.

PUB-TYPE: July 27, 1999 - Utility Patent having no previously published pre-grant publication (A)

**PUB-COUNTRY:** United States (US)

**US-MAIN-CL:** 365#189.07

**US-ADDL-CL:** 365#185.22

**CL:** 365

**SEARCH-FLD:** 365#189.07, 365#201, 365#185.22

IPC-MAIN-CL: [6] G11C 007#00

**PRIM-EXMR:** Nguyen; Tan T.

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PN
           GB9712951 D0 19970820 [GB9712951]
                      STG: Application for patent
                      AP: 1997GB-0012951 19970619
            丙 GB2314953 A 19980114 [GB2314953]
                      STG: Application published
            図 US5930179 A719990727 [US5930179]
                      STG: United States patent
                      AP: 1997US-0882835 19970626
           GB2314953 B 20000705 [GB2314953]
                      STG: Patent granted
TI
           Program circuit
           HYUNDAI ELECTRONICS IND
PA
           Hyundai Electronics Industries, Company, Ltd., Kyungki [KR]
PAO
           CHA BYOUNG KWON
IN
           1996KR-0025547 19960629
PR
IC
           G11C-007/00
           G11C-016/06
           G11C-016/10
           G11C-016/34
           G11C-016/10 [2006-01 A - I R M EP]; G11C-016/34 [2006-01 A - I R M EP]
ICAA -
ICCA -
           G11C-016/06 [2006 C - I R M EP]
EC
           G11C-016/10
           G11C-016/34V6
           ORIGINAL (O): 365189070; CROSS-REFERENCE (X): 365185220
PCL
           (US5930179)
\mathbf{CT}
           US4811294; US5299162; US5629890
           (GB9712951)
CT
           Cited in the search report
           GB2308701(A);US5566113(A)
           (US5930179)
AB
           The program circuit according to the present invention can apply a program voltage to the
           only memory cells which are not programmed during a re-programming operation, thus, the
           present invention can be prevent a lowering of reliability of the memory cell due to a
           continued supply of a program bias voltage.
OBJ
            The present invention relates to a program circuit and, more particularly, to a program circuit
            which can prevent a lowering of reliability occurring during the process of verifying the
            programmed data.
            It is therefore an object of the present invention to provide a program circuit which can apply
            a program bias voltage only to the memory cell which is not programmed during a re-
            programming operation.
ICLM -
            (US5930179)
            1. A program circuit comprising:
            a comparator for comparing output data of a data input buffer with output data of a sense
```

amplifier bit by bit, and for outputting a re-program operation signal if the data are different

from each other;

•a data latch circuit for latching the comparing results of the output data of said data input buffer and the output data of said sense amplifier; a control circuit for generating a high voltage for receiving the output data of said data input buffer and the data latched at said data latch circuit, respectively, and for outputting a signal for applying a program bias voltage to a memory cell which has not been completely programmed in response to a power-up reset signal and program state signal.

**UP** - 2000-08

1/1 LGST - ©EPO

PN - 🖪 US5930179 A 19990727 [US5930179]

**AP** - US88283597 19970626 [1997US-0882835]

**ACT** - 20020625 US/RF-A

REISSUE APPLICATION FILED

EFFECTIVE DATE: 20010725

**UP** - 2003-22

#### 1/1 CRXX - ©CLAIMS/RRX

**AN** - 3176934

PN - 🖪 5,930,179 A 19990727 [US5930179]

PA - Hyundai Electronics Industries Co Ltd KR

PT - E (Electrical)

ACT - 20010725 REISSUE REQUESTED

ISSUE DATE OF O.G.: 20020625

REISSUE REQUEST NUMBER: 09/915906

**EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 2818** 

# Reissue Patent Number:

**UP** - 2002-26

**UACT** - 2002-06-25

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# Extended Family Search Results

5930179/PN Results: 2

#### **PATENT FAMILY**

#	Patent No.	Kind	Date	Applic.No.	Date
<u>1)</u>	GB9712951	D0	19970820	1997GB-0012951	19970619
	GB2314953	Α	19980114		
	GB2314953	В	20000705		
<u>2)</u>	US5930179	Α	19990727	1997US-0882835	19970626

**Priority:** 

1996KR-0025547 19960629

11/2 PLUSPAT - ©QUESTEL-ORBIT

PN - GB9712951 D0 19970820 [GB9712951]

STG - (D0) Application for patent

TI - (D0) Program circuit

PA - (D0) HYUNDAI ELECTRONICS IND

IN - (A) CHA BYOUNG KWON

IC - (A) G11C-016/06

PN2 - 🛱 GB2314953 A 19980114 [GB2314953]

STG2 - (A) Application published

T12 - (A) Program circuit for verifying the program data in a flash memory device

PA2 - (A) HYUNDAI ELECTRONICS IND (KR)

IN2 - (A) CHA BYOUNG KWON

**IC2** - (A) G11C-016/06

PN3 - GB2314953 B 20000705 [GB2314953]

STG3 - (B) Patent granted

TI3 - (B) Program circuit

PA3 - (B) HYUNDAI ELECTRONICS IND (KR)

IN3 - (B) CHA BYOUNG KWON (KR)

**IC3** - (B) G11C-016/34

**AP** - GB9712951 19970619 [1997GB-0012951]

PR - KR19960025547 19960629 [1996KR-0025547]

ICAA - G11C-016/10 [2006-01 A - I R M EP]; G11C-016/34 [2006-01 A - I R M EP]

ICCA - G11C-016/06 [2006 C - I R M EP]

**EC** - G11C-016/10

G11C-016/34V6

DT - Basic

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2/2 PLUSPAT - @QUESTEL-ORBIT - image

🔁 US5930179 A 19990727 [US5930179]

(A) United States patent **STG** (A) Program circuit TI

(A) HYUNDAI ELECTRONICS IND (KR) PA

Hyundai Electronics Industries, Company, Ltd., Kyungki [KR] PA<sub>0</sub>

(A) CHA BYOUNG KWON (KR) IN

(A) G11C-007/00 IC

US88283597 19970626 [1997US-0882835] AP PR KR19960025547 19960629 [1996KR-0025547]

ICAA -G11C-016/10 [2006-01 A - I R M EP]; G11C-016/34 [2006-01 A - I R M EP]

G11C-016/06 [2006 C - I R M EP] ICCA -

G11C-016/10 EC G11C-016/34V6

ORIGINAL (O): 365189070; CROSS-REFERENCE (X): 365185220 **PCL** 

DT Corresponding document

### 1/1 LEGALI - ©EPO

US5930179 A 19990727 [US5930179] PN

US88283597 19970626 [1997US-0882835] AP

**ACT** 20020625 US/RF-A

REISSUE APPLICATION FILED

**EFFECTIVE DATE: 20010725** 

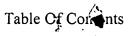
**UP** 2003-22

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⊕ ☐ TITLE 19. CUSTOMS DUTIES
<ul> <li>⊕ ☐ TITLE 20. EDUCATION</li> <li>⊕ ☐ TITLE 21. FOOD AND DRUGS</li> </ul>
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⊕ ☐ TITLE 23. HIGHWAYS
⊕ ☐TITLE 24. HOSPITALS AND ASYLUMS
⊕ ☐ TITLE 25. INDIANS
⊕ ☐ TITLE 26. INTERNAL REVENUE CODE
TITLE 27. INTOXICATING LIQUORS
<ul> <li>⊕ ☐ TITLE 28. JUDICIARY AND JUDICIAL PROCEDURE</li> <li>⊕ ☐ TITLE 29. LABOR</li> </ul>
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TITLE 31. MONEY AND FINANCE
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TITLE 33. NAVIGATION AND NAVIGABLE WATERS
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⊕ ☐ TITLE 35. PATENTS
⊕ ☐ TITLE 36. PATRIOTIC AND NATIONAL OBSERVANCES, CEREMONIES, AND ORGANIZATIONS
⊕ ☐ TITLE 37. PAY AND ALLOWANCES OF THE UNIFORMED SERVICES
<ul><li>⊕ ☐ TITLE 38. VETERANS' BENEFITS</li><li>⊕ ☐ TITLE 39. POSTAL SERVICE</li></ul>
⊕ ☐ TITLE 39. POSTAL SERVICE  ⊕ ☐ TITLE 40. PUBLIC BUILDINGS, PROPERTY, AND WORKS
TITLE 41. PUBLIC CONTRACTS
⊕ ☐ TITLE 42. THE PUBLIC HEALTH AND WELFARE
⊕ ☐ TITLE 43. PUBLIC LANDS
⊕ ☐ TITLE 44. PUBLIC PRINTING AND DOCUMENTS
⊕ ☐ TITLE 45. RAILROADS
TITLE 46. SHIPPING  OF TITLE 47. TELECHARDS TELECHARDS AND RADIOTELECHARDS
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- **⊕** ☐ TITLE 48. TERRITORIES AND INSULAR POSSESSIONS
- ⊕ ☐ TITLE 49. TRANSPORTATION
- **⊕** ☐ TITLE 50. WAR AND NATIONAL DEFENSE

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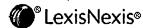
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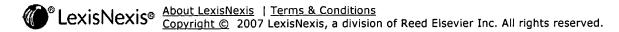


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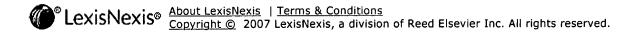
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